

EOS Production Sites

Network Performance Report: September 2014

This is a monthly summary of EOS network performance testing between production sites – comparing the measured performance against the requirements. **Significant improvements are noted in Green, Network problems in Red, System problems and Requirements issues in Gold, Issues in Orange, and other comments in Blue.**

Highlights:

- **Very stable flows**
 - **GPA: 3.63 ↓** (was 3.78 last month)
 - LaRC → JPL Downgrade (see below)
- **Requirements:** using the Network Requirements Database for 2014
 - Including GPM, OCO2, and SMAP (starting in FY '15) missions
- **Only 2 flows below Good**
 - GSFC → EROS: **Almost Adequate**
 - LaRC → JPL: **Almost Adequate**

Ratings Changes:

Upgrade: ↑: None

Downgrades: ↓:

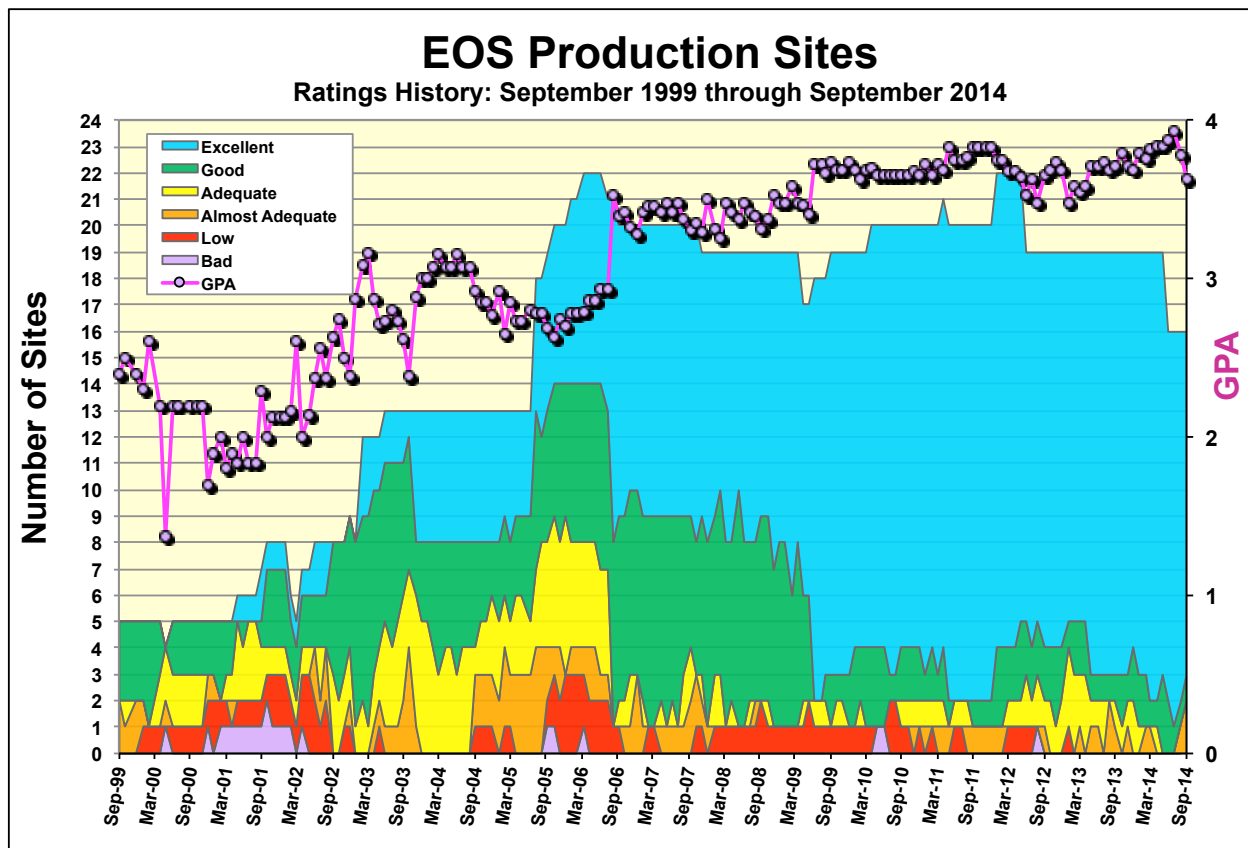
- LaRC → JPL: **Excellent** → **Almost Adequate**

Ratings Categories:

Rating	Value	Criteria
Excellent:	4	Total Kbps > Requirement * 3
Good:	3	1.3 * Requirement <= Total Kbps < Requirement * 3
Adequate:	2	Requirement < Total Kbps < Requirement * 1.3
Almost Adequate:	1.5	Requirement / 1.5 < Total Kbps < Requirement
Low:	1	Requirement / 3 < Total Kbps < Requirement / 1.5
Bad:	0	Total Kbps < Requirement / 3

Where Total Kbps = Average Integrated Kbps (where available), otherwise just iperf

Note that “**Almost Adequate**” implies meeting the requirement excluding the usual 50% contingency factor.

Ratings History:

The chart above shows the number of sites in each rating category since EOS Production Site testing started in September 1999. Note that these ratings do NOT relate to absolute performance – they are relative to the EOS requirements.

Additions and deletions:

- 2011 April: Added RSS to GHRC
- 2011 May: Deleted WSC to ASF for ALOS
- 2012 January: Added NOAA → GSFC-SD3E
Added GSFC-SD3E → Wisconsin
- 2012 June: Deleted GSFC → LASP
Deleted GSFC ← → JAXA
- 2014 June: AMSR-E no longer producing data
Deleted JPL to RSS and RSS to GHRC
Deleted JPL to NSIDC
JPL to NSIDC requirements resume in FY '15 for SMAP

Requirements Basis:

In June 2014, the requirements were updated to the latest values in the database!

- Added missions GPM, OCO2, and SMAP (effective FY '15) missions
- Removed AMSR-E, ICESAT flows
- MODIS reprocessing incorporated month-by-month
 - Reprocessing requirement begins 2014 August

In June 2012, the requirements were switched, to use the EOSDIS network requirements database.

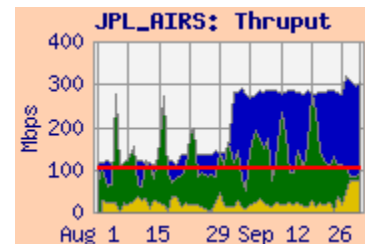
Previously, the requirements were based on the EOS Networks Requirements Handbook, Version 1.4.3 (from which the original database requirements were derived). Prior to that, the requirements were derived from version 1.4.2.

One main difference between Handbooks 1.4.2 and 1.4.3 is that in 1.4.3 most flows which occur less than once per day were averaged over their production period. These flows were typically monthly Level 3 data transfers, which were specified to be sent in just a few hours. However, they could easily be accommodated either between the per-orbit flows, or within the built-in contingency. Previously, these flows were added in linearly to the requirements, making the requirements unrealistically high.

Additionally, the contingency for reprocessing flows greater than 2X reprocessing was reduced. These flows WERE a major component of the contingency, so adding additional contingency on top of these flows was considered excessive.

Integrated Charts:

Integrated charts are included with site details, where available. These charts are “Area” charts, with a “salmon” background. A sample Integrated chart is shown here. The yellow area at the bottom represents the daily average of the user flow from the source facility (e.g., GSFC, in this example) to the destination facility (JPL, in this example) obtained from routers via “netflow”.

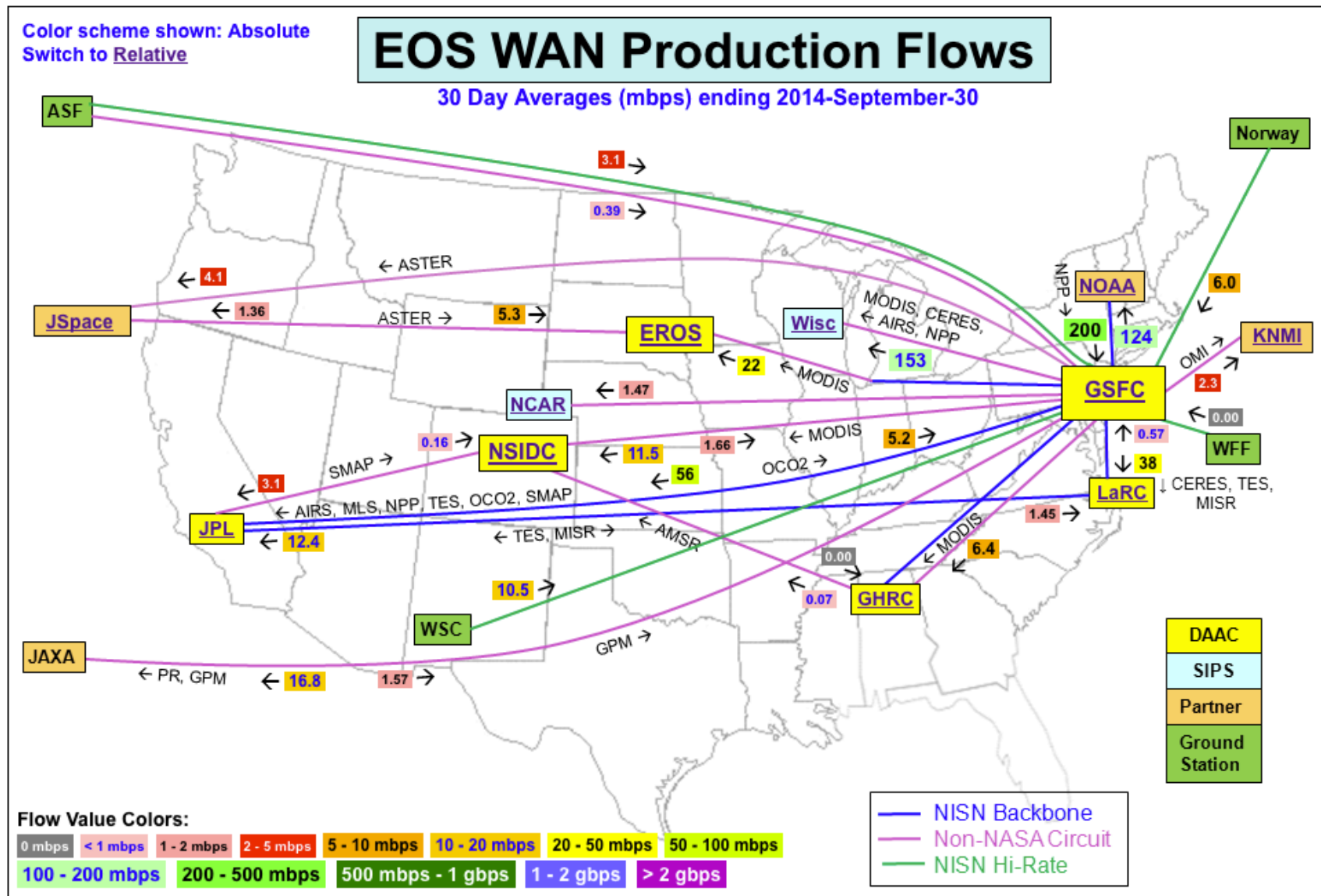


The green area is stacked on top of the user flow, and represents the “adjusted” daily average iperf throughput between the source-destination pair most closely corresponding to the requirement. This iperf measurement essentially shows the circuit capacity remaining with the user flows active. Adjustments are made to compensate for various systematic effects, and are best considered as an approximation.

The red line is the requirement for the flow from the source to destination facilities. On some charts a blue area is also present – usually “behind” the green area – representing adjusted iperf measurements from a second source node at the same facility.

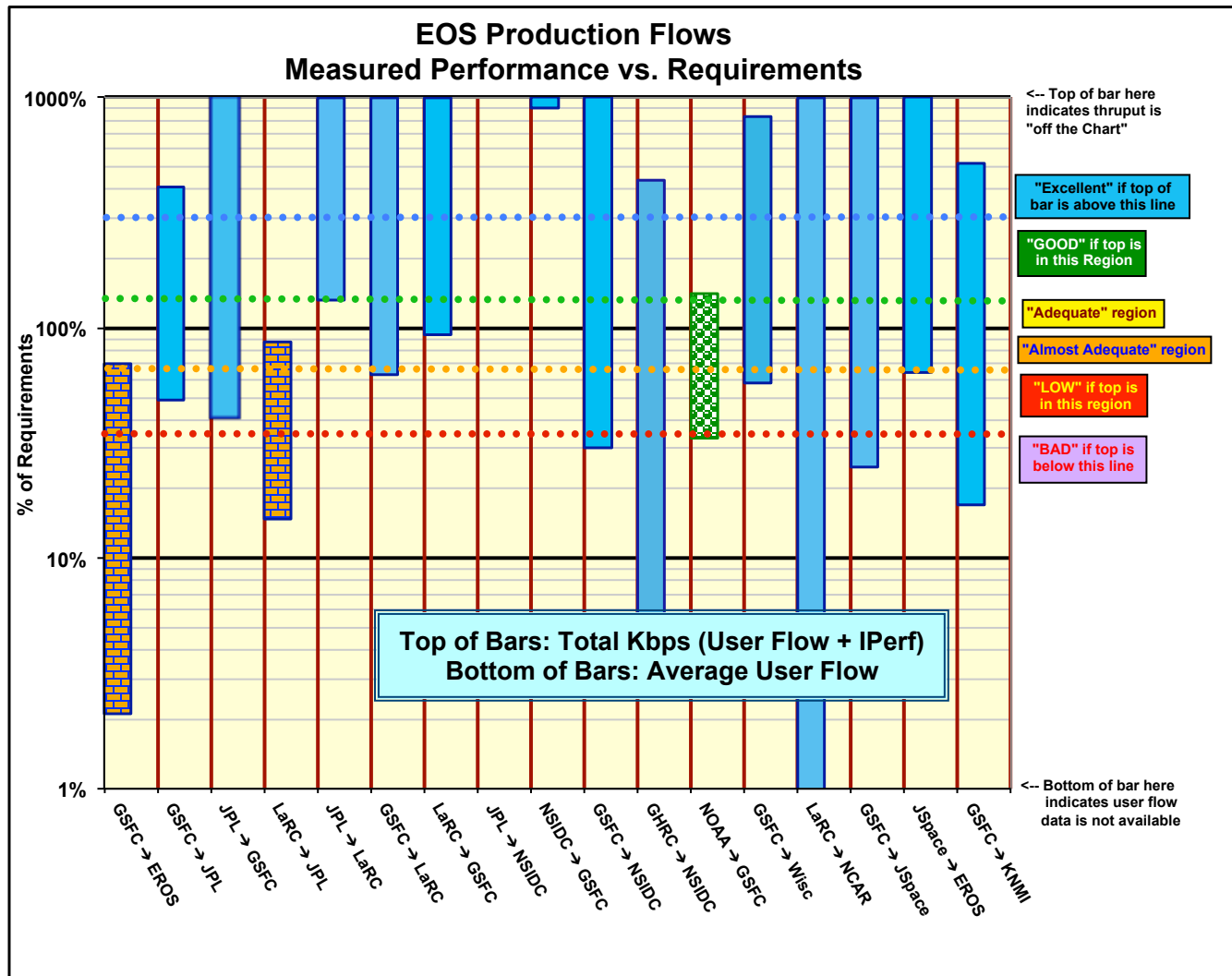
Network Requirements vs. Measured Performance

September 2014		Requirements (mbps)		Testing				Ratings	
Source → Destination	Instrument (s)	Current	Old	Source → Dest Nodes	Average User Flow mbps	iperf Median mbps	Integrated mbps	Ratings re FY '14 Requirements	
		FY '14	FY '12					This Month	Last Month
GSFC → EROS	MODIS, LandSat	1016.2	548.4	MODAPS-PDR → EROS LPDAAC	21.5	708.1	711.6	AA	AA
GSFC → JPL	AIRS, MLS, NPP, TES, OCO2, SMAP	114.8	63.0	NPP SD3E OPS1 → JPL-AIRS	56.1	460.3	471.9	Excellent	Ex
JPL → GSFC	MLS, OCO2	11.9	0.57	JPL-PODAAC → GSFC GES DISC	4.9	167.0	167.1	Excellent	Ex
LaRC → JPL	TES, MISR	83.5	83.5	LARC-ASDC → JPL-TES	12.4	72.7		AA	Ex
JPL → LaRC	TES	1.1	1.1	JPL-TES → LARC-PTH	1.45	262.1	262.1	Excellent	Ex
GSFC → LaRC	CERES, MISR, MOPITT, TES, MODIS	60.7	52.2	GSFC EDOS → LaRC ASDC	38.1	743.1	743.1	Excellent	Ex
LaRC → GSFC	MISR	0.6	0.6	LARC-ASDC → GES DISC	0.57	927.1	927.1	Excellent	Ex
JPL → NSIDC	AMSR-E, SMAP	0	0.16	JPL-PODAAC → NSIDC		291.7		n/a	n/a
NSIDC → GSFC	AMSR-E, MODIS, ICESAT	0.009	0.017	NSIDC DAAC → GES DISC	1.66	770.6	770.6	Excellent	Ex
GSFC → NSIDC	AMSR-E, MODIS, ICESAT, GBAD	38.5	8.4	MODAPS PDR → NSIDC-DAAC	11.5	653.9	654.0	Excellent	Ex
GHRC → NSIDC	AMSR-E	2.08	0.46	GHRC → NSIDC DAAC	0.07	9.1	9.1	Excellent	Ex
NOAA → GSFC	NPP	601.3	522.3	NOAA-PTH → GSFC NPP-SD3E OPS1	200.2	812.3	848.7	Good	Good
GSFC → Wisc	NPP, MODIS, CERES, AIRS	264.2	259.1	GSFC NPP-SD3E OPS1 → WISC	152.6	2166.8	2189.9	Excellent	Ex
LaRC → NCAR	MOPITT	0.044	0.044	LaRC-PTH → NCAR		181.3		Excellent	Ex
GSFC → JAXA	TRMM, AMSR-E, MODIS, GPM	15.4	3.5	GSFC-EBnet → JAXA	16.8	n/a		n/a	n/a
JAXA → GSFC	AMSR-E, GPM	3.3	0.16	JAXA → GSFC-EBnet	1.57	n/a		n/a	n/a
GSFC → JSpace	ASTER	16.4	6.8	GSFC-EDOS → JSpace-ERSD	4.08	276.5	276.5	Excellent	Ex
JSpace → EROS	ASTER	8.3	8.3	JSpace-ERSD → EROS PTH	5.33	298.2	299.2	Excellent	Ex
GSFC → KNMI	OMI	13.4	13.4	GSFC-OMISIPS → KNMI ODPS	2.28	69.3	69.4	Excellent	Ex
		Significant change from FY '12 to FY '14						Ratings Summary	
		Changed Aug 2014		Value used for ratings				FY '14 Req	
								Score	Prev
*Criteria:	Excellent	Total Kbps > Requirement * 3				Excellent		13	14
	Good	1.3 * Requirement <= Total Kbps < Requirement * 3				Good		1	1
	Adequate	Requirement < Total Kbps < Requirement * 1.3				Adequate		0	0
	Almost Adequate	Requirement / 1.5 < Total Kbps < Requirement				Almost Adequate		2	1
	Low	Requirement / 3 < Total Kbps < Requirement / 1.5				Low		0	0
	Bad	Total Kbps < Requirement / 3				Bad		0	0
Notes:		Flow Requirements include:							
		TRMM, Terra, Aqua, Aura, ICESAT, QuikScat, GEOS, NPP, GPM, SMAP, OCO2							



This chart shows the averages for the main EOS production flows for the current month. **The flows from the ground stations were added this month, as well as JPL ↔ NSIDC.** Up to date flow information can be found at http://ensight.eos.nasa.gov/Weather/web/hourly/Production_Flows-A.shtml

This graph shows a bar for each source-destination pair – relating the measurements to the requirements for that pair. The bottom of each bar represents the average measured user flow from the source site to the destination site (as a percent of the requirement) – it indicates the relationship between the requirements and actual flows. Note that the requirements generally include a 50% contingency factor above what was specified by the projects, so a value of 67% (dotted orange line) would indicate that the project is flowing as much data as requested. The top of each bar similarly represents the integrated measurement, combining the user flow with Iperf measurements – this value (when available) is used to determine the ratings.



1) EROS:

Ratings: GSFC → EROS: Continued **Almost Adequate**
 JSpace → EROS: Continued **Excellent**

1.1 GSFC → EROS:

Web Pages: <http://ensight.eos.nasa.gov/Organizations/production/EROS.shtml>
http://ensight.eos.nasa.gov/Organizations/production/EROS_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODAPS-PDR → EROS LPDAAC	808.2	708.1	416.7	21.5	711.6
GSFC-EDOS → EROS LPDAAC	425.9	400.4	27.2		
GES DISC → EROS LPDAAC	651.9	608.3	265.0		
GSFC-ENPL → EROS LPDAAC	888.0	875.3	748.5		
GSFC-ENPL → EROS PTH	2151.1	2098.6	1699.8		
GSFC-ENPL → EROS PTH (IPv6)	n/a	n/a	n/a		
GSFC-NISN → EROS PTH	817.5	636.3	295.5		
ESDIS-PS → EROS PTH	828.3	706.5	168.7		

Requirements:

Source → Dest	Date	mbps	prev	Rating
GSFC → EROS	8/14	1016.1	49.8	Almost Adequate

Comments: The rating is based on the **MODAPS-PDR** Server to EROS LP DAAC measurement, since that is the primary flow.

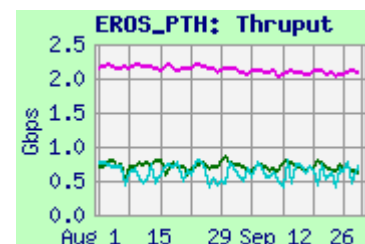
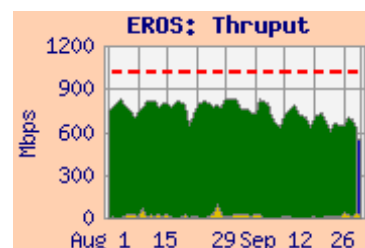
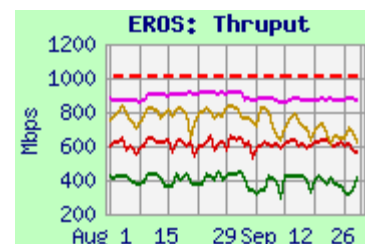
The reprocessing flow requirement began last month, so the requirement increased to 1016.1 mbps (was only 49.8 mbps previously). However, note from the integrated graph that the flow did not actually increase! The average user flow this month was similar to last month -- about 43% of the requirement without reprocessing or contingency (but only 2.1% of the requirement including reprocessing!

Thruput from all sources was slightly lower this month. The median integrated thruput from **MODAPS-PDR** to LPDAAC was more than 3 x the non-reprocessing requirement, but almost 30% below the new requirement, which includes reprocessing, so the rating remains **Almost Adequate**.

The median thruput from **GSFC-EDOS** and **GES DISC** (also on EBnet) was also slightly lower than last month, with typical low daily minimums.

The route from EBnet sources is via the Doors, to the NISN 10 gbps backbone, to the NISN Chicago CIEF, then via a NISN GigE, peering at the StarLight Gigapop with the EROS OC-48 (2.5 gbps) tail circuit.

Iperf testing for comparison is performed from **GSFC-ENPL** to both LPDAAC (the "FTL" node, outside the EROS firewall) and to EROS-PTH (both 10 gig hosts). The route from **GSFC-ENPL** to EROS is from GSFC via a direct 10 gig connection to the MAX, to Internet2, to StarLight in Chicago, then via the EROS OC-48 tail circuit. **GSFC-ENPL** (IPv4) to EROS-PTH now typically gets over 2 gbps. This shows that the capacity of this network is well in excess of the requirement (including reprocessing) – it would be rated **Good**. **GSFC-ENPL IPv6** tests have been failing since February.



1) **EROS:** (continued)

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
JSpace-ERSD → EROS LPDAAC	310.6	298.2	192.7	5.3	299.2
NSIDC SIDADS → EROS PTH	920.7	914.4	841.9		
LaRC PTH → EROS PTH	189.0	188.6	166.0		

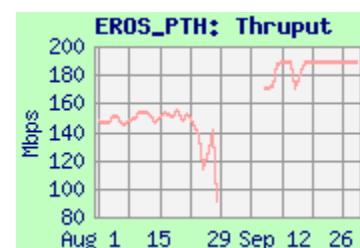
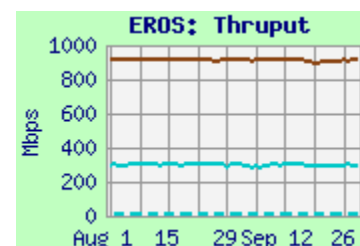
Requirements:

Source → Dest	Date	mbps	prev	Rating
ERSDAC → EROS	FY '06 –	8.3	8.3	Excellent

1.2 JSpace-ERSD → EROS: **Excellent**. See section 9 (ERSD) for further discussion.

1.3 NSIDC → EROS-PTH: Performance was stable and excellent this month.

1.4 LaRC → EROS-PTH: Testing from LaRC-PTH to EROS-PTH was restored in June (had been failing since April). The route is via NISN SIP to the Chicago CIEF to StarLight – similar to EBnet sources. Performance improved this month with an upgrade to the LaRC-PTH host, and is consistent with the LaRC-PTH 200 mbps outflow limitation.



2) to GSFC**2.1) to NPP, GES DISC, etc.**Ratings: NOAA → NPP SD3E: Continued **Good**NSIDC → GES DISC: Continued **Excellent**LDAAC → GES DISC: Continued **Excellent**JPL → GSFC: Continued **Excellent**

Web Pages:

http://ensight.eos.nasa.gov/Missions/NPP/GSFC_SD3E.shtml<http://ensight.eos.nasa.gov/Organizations/production/GDAAC.shtml>http://ensight.eos.nasa.gov/Organizations/production/ESDIS_PTH.shtmlhttp://ensight.eos.nasa.gov/Missions/icesat/GSFC_ISIPS.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
NOAA-PTH → NPP-SD3E-OPS1	833.4	812.3	763.8	200.2	848.7
EROS LPDAAC → GES DISC	262.8	229.7	150.6		
EROS PTH → GSFC-ESDIS PTH	923.0	637.3	160.5		
JPL-PODAAC → GES DISC	447.8	167.0	70.7	4.9	
JPL-PTH → GSFC-NISN	698.8	655.0	342.5		
LaRC ASDC → GES DISC	936.1	927.1	830.2	0.57	
LARC-ANGe → GSFC-ESDIS PTH	935.2	894.4	849.0		
NSIDC DAAC → GES DISC	839.0	770.6	578.5	1.66	
NSIDC DAAC → GSFC-ISIPS (scp)	31.7	31.0	27.1		

Requirements:

Source → Dest	Date	FY '14	FY '12	Rating
NSIDC → GSFC	FY '14 –	0.009	0.017	Excellent
LaRC ASDC → GES DISC	CY '12 –	0.6	0.6	Excellent
JPL → GSFC combined	FY '14 –	11.9	0.57	Excellent
NOAA → NPP SD3E	FY '14 –	601.3	522.3	Good

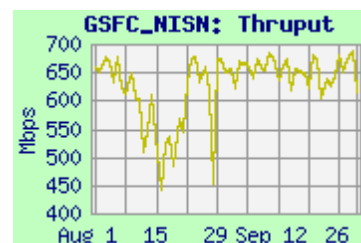
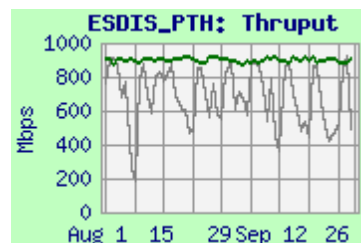
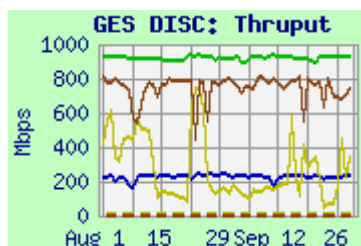
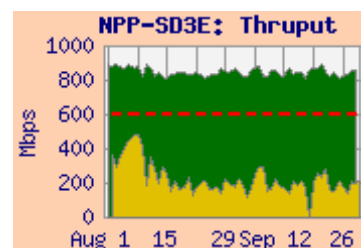
Comments:

2.1.1 NOAA → NPP-SD3E: Performance from **NOAA-PTH** to GSFC NPP-SD3E-OPS1 was very steady at about 800 mbps, limited by the Gig-E interface on the NOAA side test machine (the circuits are all 10 gbps). User flow was a bit below usual, and about 50% of the requirement (without contingency).

2.1.2 EROS LPDAAC, EROS-PTH → GSFC: The throughput for tests from **EROS LPDAAC** to GES DISC and from **EROS-PTH** to ESDIS-PTH were again noisy, with the PTH's getting better results than the DAACs.

2.1.3 JPL → GSFC: Thruput from **JPL-PODAAC** to GES DISC is noisy but long term stable. Note that JPL → EBnet flows take Internet2 instead of NISN, based on JPL routing policies. The requirement was increased in June by adding **OCO2 flows**. Thruput was well above 3 x the requirement, so the rating remains **Excellent**. The 4.9 mbps average user flow increased from 4.1 mbps in July, presumably due to OCO2 flows after its July 2 launch. It is now about 62% of the new requirement (without contingency).

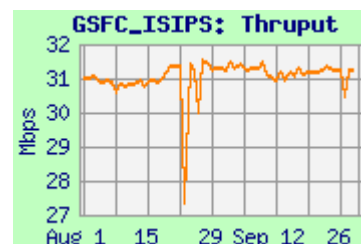
Testing from **JPL-PTH** to GSFC-NISN is routed via NISN PIP, was more stable, and shows the capability of that network.



2.1) to NPP, GES DISC continued.

2.1.4 LaRC → GSFC: Performance from **LaRC ASDC** to GES DISC was very stable this month, as it has been since the host upgrade at ASDC in February '14. Thruput from **LaRC ANGe** to ESDIS-PTH was also stable. Both results remained way above 3 x the modest requirement, so the rating continues as **Excellent**. The user flow this month was very close to the requirement.

2.1.5 NSIDC → GSFC: Performance from **NSIDC** to GES DISC improved in October 2013, due to an upgraded host at NSIDC, dropped in January due to NSIDC routing issues, and recovered in February. It remained way above the tiny requirement, so the rating remains **Excellent**. The user flow was again well above both the old and lower new requirement. Thruput to **GSFC-ISIPS** using SCP remains well above the requirement.

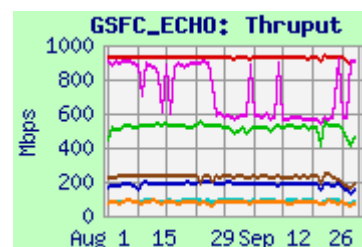


2.2 GSFC-ECHO: EOS Metadata Clearinghouse

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfc/GSFC_ECHO.shtml

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	195.8	186.8	120.6
EROS LPDAAC ftp	122.5	88.5	42.2
GES DISC	937.8	927.8	886.6
GES DISC ftp	645.2	579.7	531.6
LaRC ASDC DAAC	555.9	517.4	408.0
NSIDC DAAC	242.9	228.2	186.3
NSIDC DAAC ftp	109.1	79.1	38.5



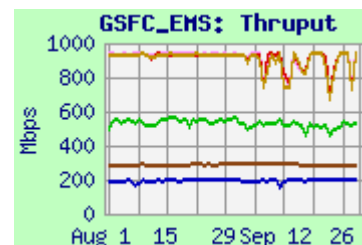
Comments: Performance was mostly stable from all sources. FTP performance is mostly limited by TCP window size – especially from sites with long RTT.

2.3 GSFC-EMS: EOS Metrics System

Web Page: http://ensight.eos.nasa.gov/Organizations/gsfc/GSFC_EMS.shtml

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
EROS LPDAAC	204.6	197.4	89.8
ESDIS-PTH	939.1	935.0	474.5
GES DISC	938.1	934.3	669.9
LARC ASDC	575.4	517.6	302.5
MODAPS-PDR	938.7	929.7	161.7
NSIDC-SIDADS	291.0	287.0	220.1



Comments: Testing is performed to GSFC-EMS from the above nodes, iperf only.. Performance was stable from all sources.

3) JPL:

3.1) GSFC → JPL:

Ratings: GSFC → JPL: Continued **Excellent**

Test Results: (additional results on next page)

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
NPP-SD3E-OPS1 → JPL-AIRS	818.4	460.3	222.7	56.1	471.9
GSFC-GES DISC → JPL-AIRS	191.5	172.8	145.9		
ESDIS-PTH → JPL-AIRS	628.7	317.5	181.6		
GSFC-NISN → JPL-AIRS	431.9	203.9	42.6		
NPP-SD3E-OPS1 → JPL-Sounder	801.5	498.8	224.9		
GSFC-NISN → JPL-Sounder	468.5	237.2	67.3		
ESDIS-PTH → JPL-MLS	492.9	441.2	268.0		
GSFC-NISN → JPL-MLS	503.8	402.2	129.0		

Requirements:

Source → Dest	Date	Mbps	Prev	Rating
GSFC → JPL Combined	FY '14	114.8	63	Excellent
GSFC → JPL AIRS	FY '14	54.3	40	Excellent
GSFC → JPL OCO2	FY '14-	36.6	-	Excellent
GSFC NPP → JPL Sounder	FY '14-	15.9	15	Excellent
GSFC → JPL Other	FY '14-	7.9	1.0	Excellent

Comments: **3.1.1 AIRS , Overall:**

http://ensight.eos.nasa.gov/Missions/aqua/JPL_AIRS.shtml

The requirements were switched in June '14 to use the updated requirements database, adding OCO2 requirements (SMAP requirements will be added later in FY'15).

Most GSFC → JPL throughput tests were stable this month, with diurnal variation observed (except from **GES DISC**, which was lower due to fewer streams being used). The median integrated throughput from **NPP-SD3E-OPS1** remains above 3 x the increased AIRS requirement, so the AIRS rating remains **Excellent**.

3.1.2 The JPL overall rating is also based on the **NPP-SD3E-OPS1** to JPL AIRS throughput, compared with the sum of all the GSFC to JPL requirements. The median throughput remained above 3 x this requirement, so the overall rating remains **Excellent**. The average user flow this month was consistent with the increased requirement, without contingency.

3.1.3 NPP to JPL Sounder:

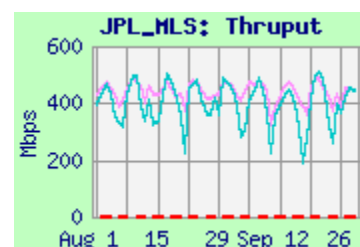
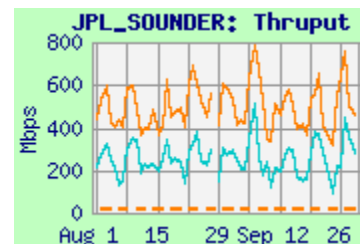
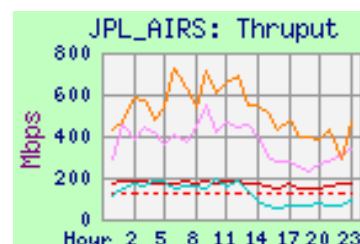
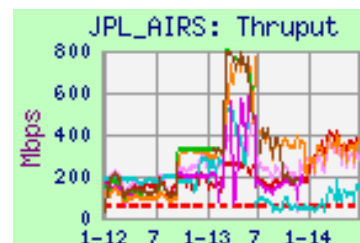
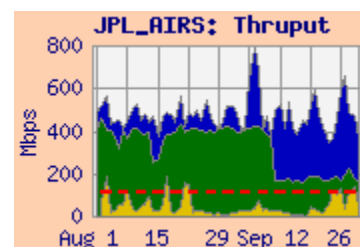
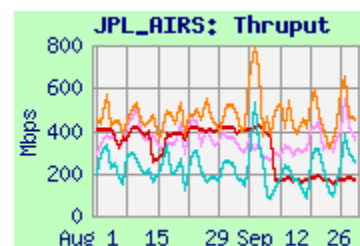
http://ensight.eos.nasa.gov/Missions/NPP/JPL_SOUNDER.shtml

Performance from **NPP-SD3E-OPS1** and **GSFC-NISN** again had significant diurnal variation this month, but was long term stable and well above the requirement rating **Excellent**.

3.1.4 MLS:

http://ensight.eos.nasa.gov/Missions/aura/JPL_MLS.shtml

Throughput from both **ESDIS-PTH** and **GSFC-NISN** also exhibited significant diurnal variation this month but were way above the modest requirement, so the rating remains **Excellent**.



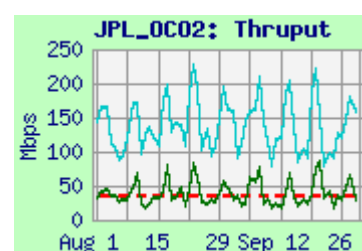
3.1) GSFC → JPL: continued

Test Results: continued

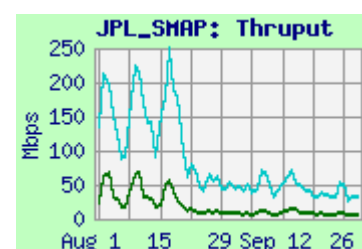
Source → Dest		Medians of daily tests (mbps)			Requirement (mbps)
		Best	Median	Worst	
GSFC-EDOS → JPL-OCO2	1 stream	98.1	30.8	1.1	36.6
	6 streams	269.2	132.6	7.7	
GSFC-EDOS → JPL-SMAP	1 stream	25.4	7.8	1.6	49 (eff 11/14)
	6 streams	111.4	40.2	10.9	
ESDIS-PTH → JPL-PODAAC		157.5	108.9	59.1	
GSFC-NISN → JPL-PODAAC		117.3	78.6	37.3	
ESDIS-PS → JPL-QSCAT		93.0	92.6	87.6	
GSFC-NISN → JPL-QSCAT		73.8	70.3	50.0	

3.1.5 OCO2:
http://ensight.eos.nasa.gov/Organizations/daac/JPL_OCO2.shtml

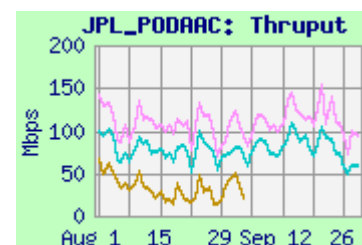
The requirement from GSFC to JPL OCO2 began in June; OCO-2 was launched July 2! Testing from EDOS to OCO2 is done using both a **single stream** and **6 streams**. Thruput exhibited significant diurnal variation, like GSFC to other JPL sites, but did NOT degrade like EDOS to SMAP, below. Performance from EDOS (using 6 streams) is rated **Excellent**. Single stream performance would be rated **Almost Adequate**.

**3.1.6 SMAP:**
http://ensight.eos.nasa.gov/Organizations/daac/JPL_SMAP.shtml

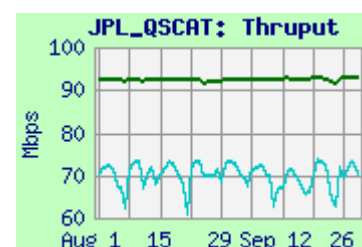
The 49 mbps requirement from GSFC to JPL SMAP begins in November 2014, before the planned launch in December. Testing from EDOS to SMAP is done using both a **single stream** and **6 streams**. Performance degraded in mid August – under investigation. Based on the median values for September, above, the rating would be **Almost Adequate** with 6 streams, but **Bad** with a single stream.

**3.1.7 PODAAC:**
http://ensight.eos.nasa.gov/Organizations/production/JPL_PODAAC.shtml

There is no longer a requirement from GSFC to JPL PODAAC in the database. Performance was a bit noisy this month, and exhibited diurnal variation. Testing from **MODAPS** was discontinued on POC request. Thruput was way above the previous 1.5 mbps PODAAC requirement.

**3.1.8 QSCAT:**
http://ensight.eos.nasa.gov/Organizations/production/JPL_QSCAT.shtml

There is no longer a requirement from GSFC to JPL QSCAT in the database. Thruput from **ESDIS-PS** to QSCAT was stable, but exhibited diurnal variation from **GSFC-NISN**. Thruput from both remained well above the modest previous 0.6 mbps requirement.



3.2) LaRC → JPLRating: ↓ **Excellent** → **Almost Adequate**

Web Pages:

http://ensight.eos.nasa.gov/Organizations/production/JPL_TES.shtmlhttp://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtmlhttp://ensight.eos.nasa.gov/Organizations/production/JPL_PTH.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow
	Best	Median	Worst	
LaRC ASDC → JPL-TES	245.4	72.7	36.6	
LaRC ANGE → JPL-PTH	303.8	257.3	30.1	12.4

Requirements:

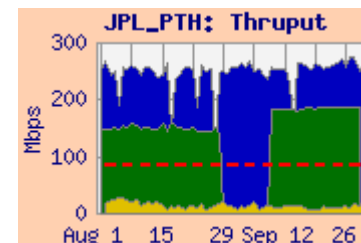
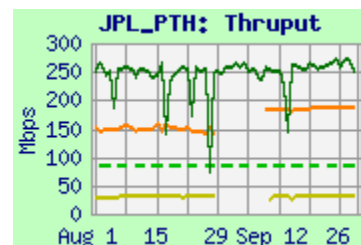
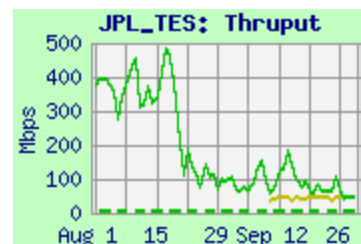
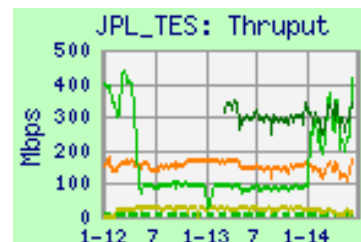
Source → Dest	Date	Mbps	Prev	Rating
LaRC → JPL-Combined	CY '12 –	83.5	69.3	Almost Adq
LaRC ASDC → JPL-MISR	CY '12 –	78.1	62.3	Bad
LaRC ASDC → JPL-TES	CY '12 –	5.5	7.0	Excellent

3.2.1 LaRC→ JPL (Overall, TES): Performance from LaRC ASDC to JPL dropped dramatically in mid August, and continued to have significant diurnal variation this month (similar to GSFC-EDOS to JPL-SMAP). LaRC ASDC to JPL-TES had improved dramatically in early January 2014 with the ASDC node upgrade! The median thrupt dropped below the combined requirements, so the Overall rating remains **Excellent**. Total LaRC to JPL user flow is under 30 % of the requirement (without contingency).

Since the ASDC performance was similar to that from LaRC ANGe (and better than from LaRC PTH), testing from LaRC ANGe and LaRC PTH to JPL-TES was discontinued in July. But with the drop from LaRC ASDC in August, testing from LaRC ANGe was restarted in October.

The median thrupt from LaRC ASDC to JPL-TES remained well over 3 x the TES requirement, so the TES rating remains **Excellent**. User flow to TES is very low.

Performance from LaRC ANGe to JPL-PTH was much more stable than LaRC ASDC to JPL-TES – no mid-August degradation is apparent.



3.2) LaRC → JPL (continued)

3.2.2 LaRC → JPL-MISR: http://ensight.eos.nasa.gov/Missions/terra/JPL_MISR.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow
	Best	Median	Worst	
LaRC ASDC → JPL-MISR	44.8	25.0	4.0	
LaRC PTH → JPL-MISR	51.3	21.4	2.0	4.8

Requirements:

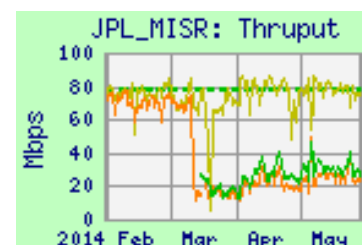
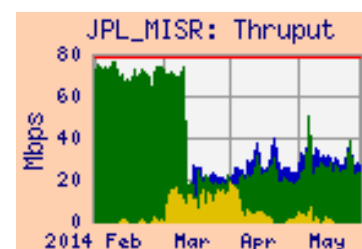
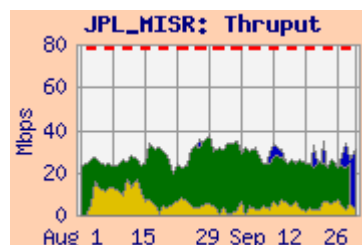
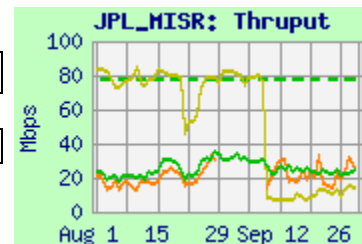
Source → Dest	Date	Mbps	Prev	Rating
LaRC ASDC → JPL-MISR	CY '12 –	78.1	62.3	Bad

Performance from **LaRC ASDC** to JPL-MISR is similar to that from **LaRC PTH**, limited by the Fast-E connection to the MISR node. Thruput to MISR from both sources dropped severely in March 2014, after improving in December 2013.

The median integrated thruput from **LaRC ASDC** was slightly below 1/3 the MISR requirement, so the MISR rating remains **Bad**. User flow averaged only about 6% of the requirement, without contingency.

Note that there was a user flow peak, beginning in late February, BEFORE the measured thruput dropped in March, suggesting that the user flow is not the cause of the thruput drop.

The LaRC → JPL Overall rating is not based on this result, however, since it not indicative of the capability of the network.



4) LaRC

4.1) JPL → LaRC

Rating: Continued **Excellent**

Web Page: http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow
	Best	Median	Worst	
JPL-PTH → LaRC PTH	509.6	502.2	296.0	1.5
JPL-TES → LaRC PTH	735.3	262.1	51.2	

Requirements:

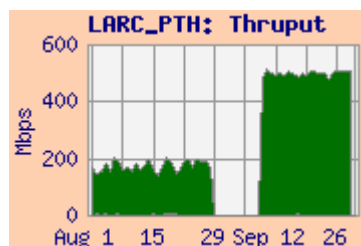
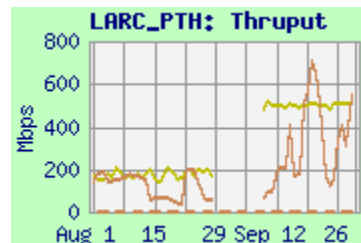
Source → Dest	Date	Mbps	Prev	Rating
JPL → LaRC	CY '12 –	1.1	1.5	Excellent

Comment: This requirement is primarily for TES products produced at the TES SIPS at JPL, being returned to LaRC for archiving. The route from JPL to LaRC is via NISN PIP. This month the thrupt from JPL-TES was noisy, but remained much higher than the requirement; the rating remains **Excellent**.

Thruput from JPL-NISN-PTH to LaRC-PTH increased at the beginning of June, when JPL-NISN-PTH was connected to a Gig-E port on a NISN switch – previously it was limited to 100 mbps due to its connection to a Fast-E port. The thrupt is now similar to thrupt from JPL-TES.

Thruput from both JPL sources to LaRC-PTH increased again in September, when LaRC-PTH was upgraded.

The JPL to LaRC integrated graph shows the 1.5 mbps user flow from JPL to LaRC this month. This is the entire NISN flow from JPL to LaRC – it may not all be EOS related. But it is consistent with the EOS requirement.



4.2) GSFC → LaRC:**Rating:** Continued **Excellent**

Web Pages : <http://ensight.eos.nasa.gov/Organizations/production/LARC.shtml>
http://ensight.eos.nasa.gov/Organizations/production/LARC_ANGe.shtml
http://ensight.eos.nasa.gov/Organizations/production/LARC_PTH.shtml

Test Results:

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GES DISC → LaRC ASDC	935.5	931.9	818.5	38.1	931.9
GSFC-EDOS → LaRC ASDC	927.6	743.1	164.5		
ESDIS-PTH → LaRC-ANGe	918.8	876.0	661.7		
GSFC-NISN → LaRC-ANGe	902.1	837.1	512.7		
GES DISC → LaRC-PTH	937.9	814.3	430.1		
GSFC-NISN → LaRC-PTH	906.1	856.7	678.7		
NPP-SD3E → LaRC-PTH	921.7	770.0	357.1		

Requirements:

Source → Dest	Date	Mbps	Prev	Rating
GSFC → LARC (Combined)	CY '12 –	60.7	52.2	Excellent

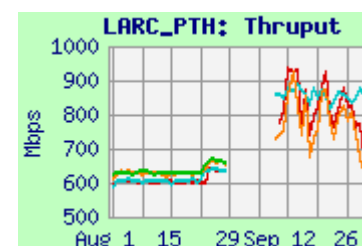
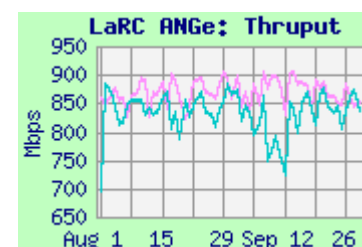
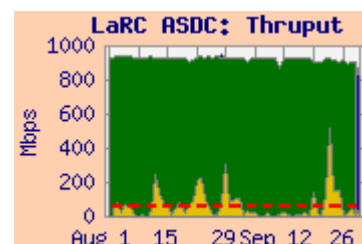
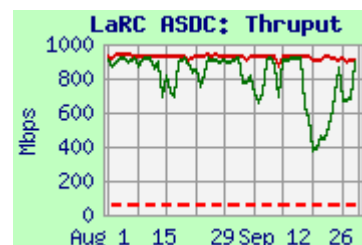
Comments:

GSFC → LaRC ASDC: Thruput from **GES DISC** to LaRC ASDC DAAC remained well above 3 x the increased combined requirement, close to the circuit limitation, so the rating remains **Excellent**. Thruput to ASDC from **GSFC-EDOS** was slightly lower and noisier, but improved a bit in mid March along with other tests from EDOS.

As seen on the integrated graph, the 38 mbps average user flow this month was close to typical and the requirement (without contingency).

GSFC → ANGe (LaTIS): Testing to ANGe ("Bob") from both **ESDIS-PTH** and **GSFC-NISN** was stable, close to the circuit limitation. (Note the expanded scale on the graph).

GSFC → LaRC-PTH: Testing to LaRC-PTH from **GES DISC**, **NPP-SD3E**, and **GSFC-NISN** improved from all sources in late September when the LaRC-PTH node was upgraded.. (Note the expanded scale on the graph). Performance is now similar to ASDC and ANGe.



5) Boulder CO sites:

5.1) NSIDC:

Ratings: GSFC → NSIDC: Continued **Excellent**

GHRC → NSIDC: Continued **Excellent**

JPL → NSIDC: **N / A**

Web Pages: <http://ensight.eos.nasa.gov/Organizations/production/NSIDC.shtml>
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_SIDADS.shtml
http://ensight.eos.nasa.gov/Organizations/production/NSIDC_PTH.shtml

Test Results: NSIDC S4PA

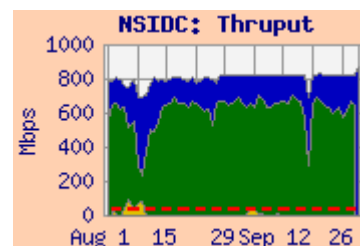
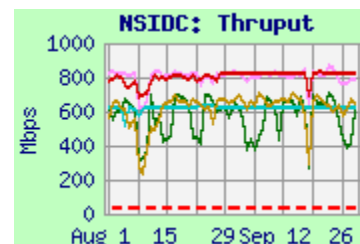
Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
MODAPS-PDR → NSIDC DAAC	792.7	653.9	421.8	11.5	654.0
GES-DISC → NSIDC DAAC	835.5	824.8	748.4		
GSFC-EDOS → NSIDC DAAC	810.2	605.6	46.4		
ESDIS-PTH → NSIDC DAAC	853.2	809.2	636.0		
GSFC-ISIPS → NSIDC (iperf)	631.4	627.2	568.0		
JPL SMAP → NSIDC DAAC	679.0	278.5	145.0		
GHRC → NSIDC DAAC (nuttcp)	37.1	9.1	3.1	0.07	
GHRC → NSIDC DAAC (ftp pull)	34.6	7.9	1.9		

Requirements:

Source → Dest	Date	Mbps	Prev	Rating
GSFC → NSIDC	8/14 –	38.5	16.8	Excellent
JPL → NSIDC	FY '14 –	-0-	0.16	N / A
GHRC → NSIDC	FY '14 –	2.08	0.46	Excellent

Comments: The requirements were updated in June to use the FY '14 database. AMSR-E flows from EDOS and JPL have been removed. The **MODIS reprocessing flow requirement is now effective, although the actual flow has not begun.**

5.1.1 GSFC → NSIDC S4PA: The rating is based on testing from the **MODAPS-PDR** server to the NSIDC DAAC, since that is the primary flow. The median throughput from **MODAPS-PDR** remained well above 3 x the increased requirement, so the rating remains **Excellent**. The 11.5 mbps average user flow was consistent with the requirement – without MODIS reprocessing or contingency.

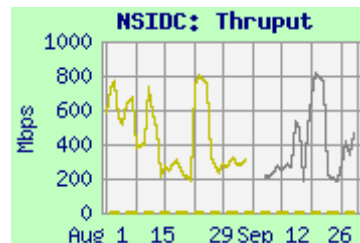


Performance from **GES-DISC**, **GSFC-EDOS**, and **GSFC-ISIPS** was also somewhat noisy but mostly stable.

5.1.2 JPL SMAP → NSIDC S4PA: The AMSR-E flow requirement was removed – there is no longer a JPL to NSIDC requirement. A new 17.1 mbps flow for SMAP will begin later in FY '15 – this requirement is under review.

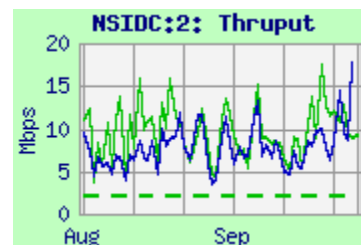
Testing to NSIDC was switched from **JPL PODAAC** to the **JPL-SMAP** test node in anticipation of the future SMAP requirements.

Throughput from **JPL-SMAP** was similar to previous testing from **JPL PODAAC**, and well in excess of the present SMAP requirement.



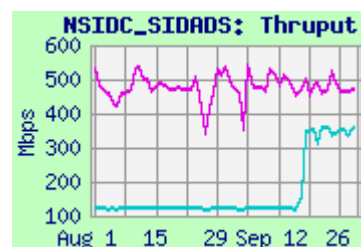
5) Boulder CO sites (Continued):

5.1.3 GHRC, GHRC-ftp → NSIDC S4PA: GHRC (NSSTC, UAH, Huntsville, AL) sends **reprocessed** AMSR-E data to NSIDC via Internet2. The median integrated thrupt remained above 3 x the 2.08 mbps requirement, **so the rating remains Excellent**. This requirement increases to 5.14 mbps next month, when the next reprocessing campaign begins.

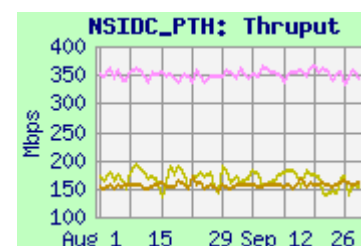


Test Results: NSIDC-SIDADS, NSIDC-PTH

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL → NSIDC-SIDADS	562.5	476.0	375.5
GSFC-NISN → NSIDC-SIDADS	149.2	121.6	114.7
ESDIS-PTH → NSIDC-PTH	406.8	352.5	246.6
MODAPS-PDR → NSIDC-PTH	184.8	156.7	135.4
JPL-NISN-PTH → NSIDC-PTH	239.0	166.4	99.8



5.1.4 GSFC → NSIDC-SIDADS: Performance from **GSFC-ENPL** was retuned in June (using 30 streams, to compensate for the small window size on SIDADS) with increased thrupt. Testing from **GSFC-NISN** was similarly retuned in September.



5.1.5 NSIDC-PTH: Thrupt from GSFC sources to NSIDC-PTH was stable. **JPL-NISN-PTH** was limited by its Fast-E connection until it was upgraded and testing retuned in June. The NSIDC-PTH machine is scheduled for replacement and upgrade soon.

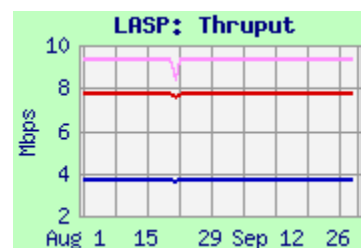
5.2) LASP:

Ratings: LASP → GSFC: Continued **Excellent**

Web Page: <http://ensight.eos.nasa.gov/Organizations/production/LASP.shtml>

Test Results:

Source → Dest	Medians of daily tests (mbps)		
	Best	Median	Worst
ESDIS-PTH → LASP blue (scp)	3.70	3.67	3.60
ESDIS-PTH → LASP blue (iperf)	9.37	9.37	8.44
GES DISC → LASP blue (iperf)	7.76	7.75	6.46
LASP → GES DISC	9.32	9.31	8.95

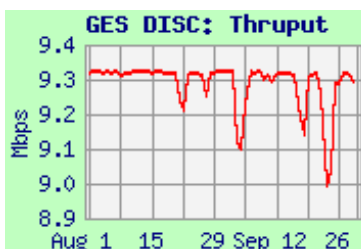


Requirement:

Source → Dest	Date	Mbps	Rating
LASP → GES DISC	CY '10 -	0.016	Excellent

Comments: In January '11, LASP's connection to NISN PIP was rerouted to a 10 mbps connection to the NISN POP in Denver; previously it was 100 mbps from CU-ITS via NSIDC.

Iperf testing from **GES DISC** has been very stable since February 2013, when it improved with the GES DISC firewall upgrade. Iperf and SCP testing from **ESDIS-PTH** was also very stable, and consistent with the circuit limitation, as was return testing from **LASP** to GES DISC, rating **Excellent**.



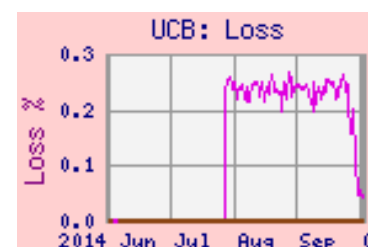
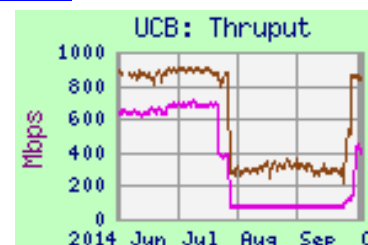
5.3) UCB: <http://ensight.eos.nasa.gov/Organizations/daac/UCB.shtml>

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
GSFC-ENPL	107.2	74.8	55.1
GSFC-ESTO	438.0	293.5	171.5

Comments: Testing to the 10 gig connected test node at UCB began failing consistently in mid-May 2013 (restored in October), so testing was switched to a 1 gig test node in mid-June '13. The route is via Internet2 to FRGP, similar to NCAR.

Thruput from both **GSFC-ENPL** and **GSFC-ESTO** dropped severely at the end of July, with high packet loss. At the end of July, all tests to Boulder performed poorly. Testing to UCB recovered in late September (other Boulder sites recovered in early August).



5.4) NCAR:

Ratings: LaRC → NCAR: Continued **Excellent**
GSFC → NCAR: Continued **Excellent**

Web Pages <http://ensight.eos.nasa.gov/Missions/terra/NCAR.shtml>

Test Results:

Source	Medians of daily tests (mbps)		
	Best	Median	Worst
LaRC PTH	181.9	181.3	165.5
GSFC-ENPL-10G	3776.3	1989.8	821.0
GSFC-ENPL-FE	94.6	94.4	93.9
GSFC-NISN	829.9	750.0	379.7

Requirement:

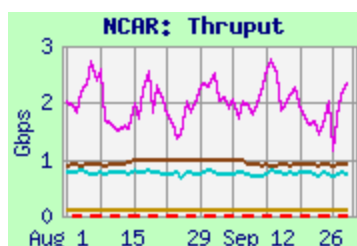
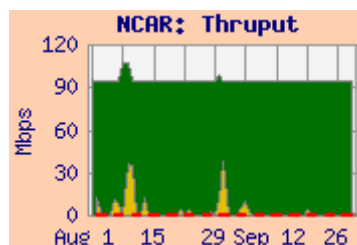
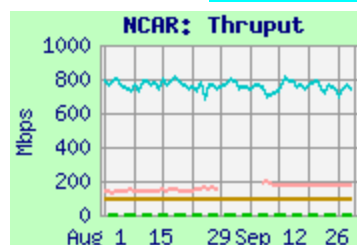
Source	Date	Mbps	Prev	Rating
LaRC	CY '12 -	0.044	0.1	Excellent
GSFC	CY '12 -	0.111	5.0	Excellent

Comments: NCAR has a SIPS for MOPITT (Terra, from LaRC), and has MOPITT and HIRDLS (Aura, from GSFC) QA requirements. Testing is to NCAR's 10 gigabit capable PerfSonar since March '12.

From LaRC: Thruput from **LaRC-PTH** improved a bit with the **LaRC-PTH** upgrade in September, but remains limited to 200 mbps by agreement with CSO / NISN. The median remained well above 3 x the tiny requirement, so the rating remains **Excellent**.

From GSFC: From **GSFC-NISN**, the route is via NISN to the MAX (similar route as from **LaRC-PTH**). Thruput was quite stable this month. The median was well above 3 x the tiny requirement, so the rating remains **Excellent**. The user flow from GSFC-EBnet was about 1.2 mbps this month – after a few peaks in previous months. This is above the revised requirement, but closer to the previous requirement.

From **GSFC-ENPL-10G**, with a 10 Gig-E interface, and a 10 gig connection to MAX, performance to NCAR's 10 Gig PerfSonar node is also noisy, but averages over 2 gbps, and gets over 3 gbps on peaks.



6) Wisconsin:Rating: Continued **Excellent**Web Pages <http://ensight.eos.nasa.gov/Missions/NPP/WISC.shtml>**Test Results:**

Source Node	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
NPP-SD3E	2773.0	2166.8	1282.0	152.6	2189.9
GES DISC	598.3	580.3	558.2		
GSFC ENPL	606.8	211.2	74.3		
LaRC ANGe	561.9	526.2	401.2		

Requirements:

Source Node	Date	mbps	Prev	Rating
NPP-SD3E	FY'14 -	242.3	237.2	Excellent
GSFC MODAPS	FY'14 -	21.9	16.5	Excellent
GSFC Combined	FY'14 -	264.2	253.7	Excellent
LaRC Combined	CY'12 -	n/a	7.9	n/a

Comments: The University of Wisconsin is included in this Production report due to its function as Atmosphere PEATE for NPP. Wisconsin continues to be an SCF on the MODIS, CERES and AIRS teams.

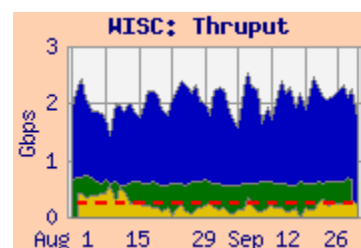
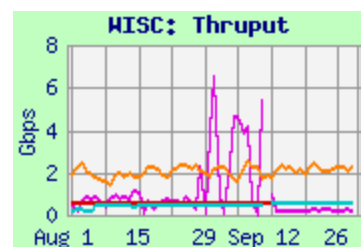
GSFC: Testing from **NPP-SD3E** was switched to Wisconsin's 10 gig server in May 2013, with thrupt now usually close to 2 gbps! The integrated thrupt from **NPP-SD3E** remained above the NPP requirement by more than 3 x, so the NPP rating remains **Excellent**. It was also above the GSFC combined requirement by more than 3 x, so the combined rating also remains **Excellent**.

Testing from **GSFC-ENPL** was switched to the 10 gig server at Wisconsin (SSEC) at the end of March 2013. But due to problems this month, the usual server was switched to a backup, with reduced results.

User flow was consistent to the requirement, similar to last month.

The route from EBnet at GSFC is via MAX to Internet2, peering with MREN in Chicago.

LaRC: There is no longer a CERES requirement from LaRC to Wisconsin. In April 2013, testing from **LaRC ANGe** was switched to the new SSEC 10 gig server; performance improved at that time. Thrupt from **LaRC ANGe** remains well above the previous 7.9 mbps requirement; it would be rated **Excellent**. The route from LaRC is via NISN, peering with MREN in Chicago.



7) KNMI:Rating: Continued **Excellent**Web Pages http://ensight.eos.nasa.gov/Missions/aura/KNMI_ODPS.shtml**Test Results:**

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
OMISIPS → KNMI-ODPS	127.6	69.3	50.7	2.28	69.4
GSFC-ENPL → KNMI-ODPS	245.0	56.3	32.5		

Requirements:

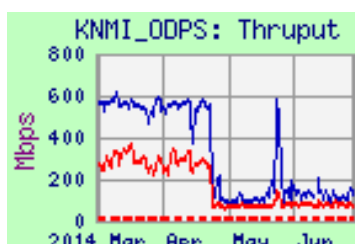
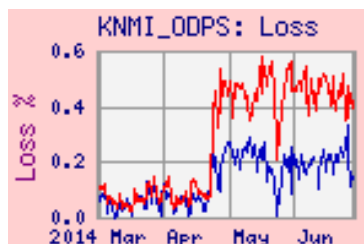
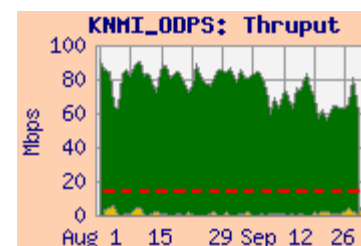
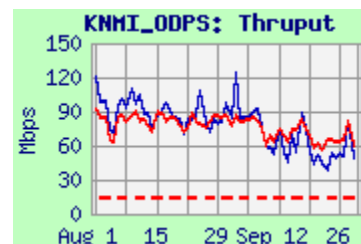
Source Node	Date	mbps	Prev	Rating
OMISIPS	CY'12 -	13.4	0.03	Excellent

Comments: KNMI (DeBilt, Netherlands) is a SIPS and QA site for OMI (Aura). The route from GSFC is via MAX to Internet2, peering in DC with Géant's 2+ x 10 gbps circuit to Frankfurt, then via Surfnets through Amsterdam.

The requirement was increased with the use of the database to 13.4 mbps, a much more realistic value than the previous 0.03 mbps.

The rating is based on the results from **OMISIPS** on EBnet at GSFC to the ODPS primary server at KNMI. **Thruput from both sources was stable until near the end of April, when it dropped significantly, due to increased packet loss. But the median thruput remains well above 3 x the increased requirement, so the rating remains Excellent.**

The user flow, however, averaged only 2.28 mbps this month, similar to recent months, but only 17% of the revised requirement.



8) JSpace - ERSD:

Ratings: **GSFC → ERSD: Continued Excellent**
ERSD → EROS: Continued Excellent
ERSD → JPL-ASTER-IST: N/A

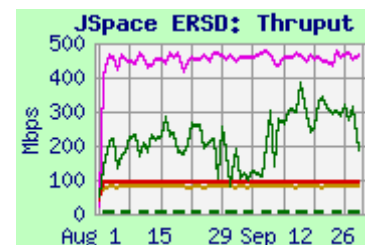
Web Page: <http://ensight.eos.nasa.gov/Organizations/production/ERSDAC.shtml>

US ↔ JSpace - ERSD Test Results

Source → Dest	Medians of daily tests (mbps)			User Flow	Integrated
	Best	Median	Worst		
GSFC-EDOS → JSpace-ERSD	437.3	276.5	9.8	4.1	276.5
GES DISC → JSpace-ERSD	93.8	92.3	76.2		
GSFC ENPL (FE) → JSpace-ERSD	86.1	81.6	66.7		
GSFC ENPL (GE) → JSpace-ERSD	485.5	458.0	193.5		
JSpace-ERSD → EROS	310.6	298.2	192.7	5.3	299.2
JSpace-ERSD → JPL-TES	88.5	31.3	17.4		

Requirements:

Source → Dest	CY	Mbps	Prev	Rating
GSFC → JSpace-ERSD	'14 -	16.4	6.75	Excellent
JSpace-ERSD → JPL-ASTER IST	'12 -	0.31	0.31	Excellent
JSpace-ERSD → EROS	'12 -	8.33	8.3	Excellent



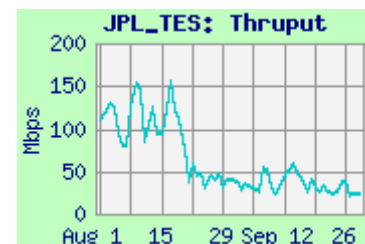
Comments: 8.1 GSFC → JSpace-ERSD: The median thrupt to JSpace-ERSD from most sources improved in September 2011, when the connection from JSpace-ERSD to Tokyo-XP was upgraded to 1 gbps (from 100 mbps).

Performance from all sources became less noisy and more stable at the end of July. Thrupt had become very noisy starting in mid-May. The JSpace POC reports that they were ingesting large amounts of PALSAR data, affecting performance.

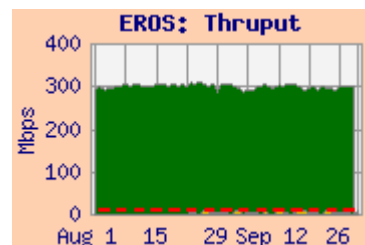
Median integrated thrupt from **GSFC-EDOS** stabilized well above 3 x the increased requirement, so the rating remains **Excellent**. The 4.1 mbps user flow from GSFC to JSpace-ERSD was close to normal this month, below the increased requirement.

Thrupt from **GSFC ENPL** also stabilized averaging over 400 mbps.

8.2 JSpace-ERSD → JPL-ASTER-IST: The JPL-ASTER-IST test node was retired in October 2012. JPL no longer uses a distinct IST; instead, JPL personnel log in directly to the IST at JSpace-ERSD. As a substitute, testing was initiated from ERSD to a different node at JPL ("TES"). Results to TES were noisy and dropped significantly in mid August, but would still be rated **Excellent**.



8.3 JSpace-ERSD → EROS: Thrupt was stable and remains well above the reduced requirement (was 26.8 mbps previously), so the rating remains **Excellent**. The user flow this month was consistent with the requirement, without contingency.



10) GSFC \leftrightarrow JAXARatings: GSFC \rightarrow JAXA: N/AJAXA \rightarrow GSFC: N/A

The JAXA test hosts at EOC Hatoyama were retired on March 31, 2009. No additional testing is planned for AMSR or TRMM. All testing to JAXA-TKSC for ALOS was terminated at the end of June '09. We are working with JAXA to test different protocols for GPM -- but testing has not yet been initiated.

However, the user flow between GSFC-EBnet and JAXA continues to be measured. As shown below, the user flow this month averaged 17.4 mbps from GSFC-EBnet to JAXA, and 1.5 mbps from JAXA to GSFC-EBnet.

These values are more or less consistent with the new database requirements of 15.4 mbps from GSFC to JAXA, and 3.3 mbps from JAXA back to GSFC (The AMSR-E requirement from JAXA to JPL has been removed, due to AMSR-E failure). However, since no iperf tests are run, the true capability of the network cannot be determined, and therefore no rating is assigned.



For comparison, testing is performed from GSFC to a test node at the Tokyo Exchange point, which is on the route from GSFC to JAXA. Performance to the Tokyo-XP 10 gig server, is well in excess of the JAXA requirements.

